

REFERENCES

- [1] A. Hilbig, D. Lehmann, and M. Pradel, “An empirical study of real-world webassembly binaries: Security, languages, use cases,” *Proceedings of the Web Conference 2021*, 2021.
- [2] J. Cabrera Arteaga, O. Floros, O. Vera Perez, B. Baudry, and M. Monperrus, “Crow: code diversification for webassembly,” in *MADWeb, NDSS 2021*, 2021.
- [3] J. Cabrera Arteaga, P. Laperdrix, M. Monperrus, and B. Baudry, “Multi-Variant Execution at the Edge,” *arXiv e-prints*, p. arXiv:2108.08125, Aug. 2021.
- [4] J. Cabrera-Arteaga, N. Fitzgerald, M. Monperrus, and B. Baudry, “WASM-MUTATE: Fast and Effective Binary Diversification for WebAssembly,” *arXiv e-prints*, p. arXiv:2309.07638, Sept. 2023.
- [5] M. Willsey, C. Nandi, Y. R. Wang, O. Flatt, Z. Tatlock, and P. Panchekha, “Egg: Fast and extensible equality saturation,” *Proc. ACM Program. Lang.*, vol. 5, jan 2021.
- [6] J. Cabrera Arteaga, “Artificial software diversification for webassembly,” 2022. QC 20220909.
- [7] M. Jacob, M. H. Jakubowski, P. Naldurg, C. W. N. Saw, and R. Venkatesan, “The superdiversifier: Peephole individualization for software protection,” in *International Workshop on Security*, pp. 100–120, Springer, 2008.
- [8] M. Henry, “Superoptimizer: a look at the smallest program,” *ACM SIGARCH Computer Architecture News*, vol. 15, pp. 122–126, Nov 1987.
- [9] R. Sasnauskas, Y. Chen, P. Collingbourne, J. Ketema, G. Lup, J. Taneja, and J. Regehr, “Souper: A Synthesizing Superoptimizer,” *arXiv preprint 1711.04422*, 2017.
- [10] S. Narayan, C. Disselkoen, D. Moghimi, S. Cauligi, E. Johnson, Z. Gang, A. Vahldiek-Oberwagner, R. Sahita, H. Shacham, D. Tullsen, *et al.*, “Swivel: Hardening webassembly against spectre,” in *USENIX Security Symposium*, 2021.
- [11] E. Johnson, D. Thien, Y. Alhessi, S. Narayan, F. Brown, S. Lerner, T. McMullen, S. Savage, and D. Stefan, “Sfi safety for native-compiled wasm,” *NDSS. Internet Society*, 2021.
- [12] “Webassembly system interface.” <https://github.com/WebAssembly/WASI>, 2021.
- [13] R. Sasnauskas, Y. Chen, P. Collingbourne, J. Ketema, G. Lup, J. Taneja, and J. Regehr, “Souper: A Synthesizing Superoptimizer,” *arXiv e-prints*, p. arXiv:1711.04422, Nov. 2017.

- [14] W. C. Group, “Webassembly specification: Webassembly runtime.” <https://webassembly.github.io/spec/core/exec/runtime.html>, 2021. Version 1.0.
- [15] D. Cao, R. Kunkel, C. Nandi, M. Willsey, Z. Tatlock, and N. Polikarpova, “Babble: Learning better abstractions with e-graphs and anti-unification,” *Proc. ACM Program. Lang.*, vol. 7, jan 2023.
- [16] R. Tate, M. Stepp, Z. Tatlock, and S. Lerner, “Equality saturation: A new approach to optimization,” in *Proceedings of the 36th Annual ACM SIGPLAN-SIGACT Symposium on Principles of Programming Languages*, POPL ’09, (New York, NY, USA), p. 264–276, Association for Computing Machinery, 2009.
- [17] T. Rokicki, C. Maurice, M. Botvinnik, and Y. Oren, “Port contention goes portable: Port contention side channels in web browsers,” in *Proceedings of the 2022 ACM on Asia Conference on Computer and Communications Security*, ASIA CCS ’22, (New York, NY, USA), p. 1182–1194, Association for Computing Machinery, 2022.
- [18] S. Cao, N. He, Y. Guo, and H. Wang, “WASMixer: Binary Obfuscation for WebAssembly,” *arXiv e-prints*, p. arXiv:2308.03123, Aug. 2023.
- [19] J. Cabrera-Arteaga, M. Monperrus, T. Toady, and B. Baudry, “Webassembly diversification for malware evasion,” *Computers & Security*, vol. 131, p. 103296, 2023.
- [20] S. Narayan, C. Disselkoen, D. Moghimi, S. Cauligi, E. Johnson, Z. Gang, A. Vahldiek-Oberwagner, R. Sahita, H. Shacham, D. Tullsen, and D. Stefan, “Swivel: Hardening WebAssembly against spectre,” in *30th USENIX Security Symposium (USENIX Security 21)*, pp. 1433–1450, USENIX Association, Aug. 2021.

Part II

Included papers

